

RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

FCC ID: WQ8IA800-CAM

EUT Specification

EUT	Maxisys Intelligent ADAS IA800 Camera & Adaptor Kit
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input checked="" type="checkbox"/> WLAN: 5.18GHz ~ 5.24GHz <input checked="" type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others: 2.402GHz~2.480GHz
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	2.4G WiFi: 18.18 dBm (0.0657W) 5.1G WiFi: 18.99 dBm (0.0793W) 5.8G WiFi: 17.32 dBm (0.0540W)
Antenna gain (Max)	WiFi 2.4G: ANT A & ANT B 3.9 dBi WiFi 5.1G&WiFi 5.8G: ANT A & ANT B 3.9 dBi
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

Limits for Maximum Permissible Exposure(MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm ²)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

Friis transmission formula: $P_d = \frac{P_{out} * G}{4 * \pi * R^2}$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in Mw

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

2.4G WiFi ANT A:

Operating Mode	Channel Frequency (MHz)	Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/ cm ²)	Power density Limits (mW/cm ²)
802.11g	2412	14.87	14.87±1	15.87	3.9	0.0189	1
	2437	14.34	14.34±1	15.34	3.9	0.0167	1
	2462	13.81	13.81±1	14.81	3.9	0.0148	1
802.11n (HT20)	2412	15.10	15.10±1	16.1	3.9	0.0199	1
	2437	14.52	14.52±1	15.52	3.9	0.0174	1
	2462	15.10	15.10±1	16.1	3.9	0.0199	1

2.4G WiFi ANT B:

Operating Mode	Channel Frequency (MHz)	Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/ cm ²)	Power density Limits (mW/cm ²)
802.11g	2412	15.31	15.31±1	16.31	3.9	0.0209	1
	2437	14.61	14.61±1	15.61	3.9	0.0178	1
	2462	14.28	14.28±1	15.28	3.9	0.0165	1
802.11n (HT20)	2412	15.24	15.24±1	16.24	3.9	0.0205	1
	2437	14.90	14.90±1	15.9	3.9	0.0190	1
	2462	14.48	14.48±1	15.48	3.9	0.0172	1

ANT A+ANT B

Operating Mode	Channel Frequency (MHz)	ANT A Power density at 20cm (mW/ cm ²)	ANT B Power density at 20cm (mW/ cm ²)	ANT A+ANT B Power density at 20cm (mW/ cm ²)	Power density Limits (mW/cm ²)
802.11n (HT20)	2412	0.0199	0.0205	0.0404	1
	2437	0.0174	0.0190	0.0364	1
	2462	0.0199	0.0172	0.0371	1

5.1G WiFi ANT A:

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	(mW/cm ²)
802.11a	5180	15.13	15.13±1	16.13	3.9	0.0200	1
	5200	15.81	15.81±1	16.81	3.9	0.0234	1
	5240	15.67	15.67±1	16.67	3.9	0.0227	1
802.11n20	5180	14.60	14.60±1	15.6	3.9	0.0177	1
	5200	14.73	14.73±1	15.73	3.9	0.0183	1
	5240	14.86	14.86±1	15.86	3.9	0.0188	1
802.11ac20	5180	14.92	14.92±1	15.92	3.9	0.0191	1
	5200	15.08	15.08±1	16.08	3.9	0.0198	1
	5240	14.84	14.84±1	15.84	3.9	0.0187	1
802.11n40	5190	15.84	15.84±1	16.84	3.9	0.0236	1
	5230	15.69	15.69±1	16.69	3.9	0.0228	1
802.11ac40	5190	15.55	15.55±1	16.55	3.9	0.0221	1
	5230	15.28	15.28±1	16.28	3.9	0.0207	1
802.11ac80	5210	15.41	15.41±1	16.41	3.9	0.0214	1

5.1G WiFi ANT B:

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	(mW/cm ²)
802.11a	5180	15.86	15.86 ± 1	16.86	3.9	0.0237	1
	5200	15.27	15.27 ± 1	16.27	3.9	0.0207	1
	5240	15.77	15.77 ± 1	16.77	3.9	0.0232	1
802.11n20	5180	15.21	15.21 ± 1	16.21	3.9	0.0204	1
	5200	15.54	15.54 ± 1	16.54	3.9	0.0220	1
	5240	15.82	15.82 ± 1	16.82	3.9	0.0235	1
802.11ac20	5180	14.85	14.85 ± 1	15.85	3.9	0.0188	1
	5200	15.05	15.05 ± 1	16.05	3.9	0.0197	1
	5240	14.87	14.87 ± 1	15.87	3.9	0.0189	1
802.11n40	5190	16.12	16.12 ± 1	17.12	3.9	0.0252	1
	5230	15.90	15.90 ± 1	16.9	3.9	0.0239	1
802.11ac40	5190	15.95	15.95 ± 1	16.95	3.9	0.0242	1
	5230	15.45	15.45 ± 1	16.45	3.9	0.0216	1
802.11ac80	5210	15.26	15.26 ± 1	16.26	3.9	0.0206	1

ANT A+ANT B:

Operating Mode	Channel Frequency	ANT A Power density at 20cm	ANT B Power density at 20cm	ANT A+ANT B Power density at 20cm	Power density Limits
	(MHz)	(mW/ cm ²)	(mW/ cm ²)	(mW/ cm ²)	(mW/cm ²)
802.11a	5180	0.0200	0.0237	0.0382	1
	5200	0.0234	0.0207	0.0402	1
	5240	0.0227	0.0232	0.0423	1
802.11n20	5180	0.0177	0.0204	0.0379	1
	5200	0.0183	0.0220	0.0395	1
	5240	0.0188	0.0235	0.0376	1
802.11ac20	5180	0.0191	0.0188	0.0487	1
	5200	0.0198	0.0197	0.0467	1
	5240	0.0187	0.0189	0.0462	1
802.11n40	5190	0.0236	0.0252	0.0423	1
	5230	0.0228	0.0239	0.0420	1
802.11ac40	5190	0.0221	0.0242	0.0382	1
	5230	0.0207	0.0216	0.0402	1
802.11ac80	5210	0.0214	0.0206	0.0423	1

5.8G WiFi ANT A:

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	(mW/cm ²)
802.11a	5745	14.73	14.73±1	15.73	3.9	0.0183	1
	5785	14.92	14.92±1	15.92	3.9	0.0191	1
	5825	14.60	14.60±1	15.6	3.9	0.0177	1
802.11n20	5745	13.31	13.31±1	14.31	3.9	0.0132	1
	13.31	13.31	13.31±1	14.36	3.9	0.0133	1
	5825	14.56	14.56±1	15.56	3.9	0.0176	1
802.11ac20	5745	14.04	14.04±1	15.04	3.9	0.0156	1
	5785	14.54	14.54±1	15.54	3.9	0.0175	1
	5825	13.79	13.79±1	14.79	3.9	0.0147	1
802.11n40	5755	14.80	14.80±1	15.8	3.9	0.0186	1
	5795	14.59	14.59±1	15.59	3.9	0.0177	1
802.11ac40	5755	14.67	14.67±1	15.67	3.9	0.0180	1
	5795	14.84	14.84±1	15.84	3.9	0.0187	1
802.11ac80	5775	15.02	15.02±1	16.02	3.9	0.0195	1

5.8G WiFi ANT B:

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm ²)	(mW/cm ²)
802.11a	5745	12.62	12.62±1	13.62	3.9	0.0112	1
	5785	12.58	12.58±1	13.58	3.9	0.0111	1
	5825	12.00	12.00±1	13	3.9	0.0097	1
802.11n20	5745	11.92	11.92±1	12.92	3.9	0.0096	1
	5785	12.30	12.30±1	13.3	3.9	0.0104	1
	5825	11.97	11.97±1	12.97	3.9	0.0097	1
802.11ac20	5745	11.85	11.85±1	12.85	3.9	0.0094	1
	5785	12.06	12.06±1	13.06	3.9	0.0099	1
	5825	11.58	11.58±1	12.58	3.9	0.0088	1
802.11n40	5755	13.75	13.75±1	14.75	3.9	0.0146	1
	5795	13.58	13.58±1	14.58	3.9	0.0140	1
802.11ac40	5755	12.52	12.52±1	13.52	3.9	0.0110	1
	5795	12.63	12.63±1	13.63	3.9	0.0113	1
802.11ac80	5775	12.19	12.19±1	13.19	3.9	0.0102	1

ANT A+ANT B:

Operating Mode	Channel Frequency	ANT A Power density at 20cm	ANT B Power density at 20cm	ANT A+ANT B Power density at 20cm	Power density Limits
	(MHz)	(mW/ cm2)	(mW/ cm2)	(mW/ cm2)	(mW/cm2)
802.11a	5745	0.0183	0.0112	0.0227	1
	5785	0.0191	0.0111	0.0238	1
	5825	0.0177	0.0097	0.0273	1
802.11n20	5745	0.0132	0.0096	0.0250	1
	5785	0.0133	0.0104	0.0273	1
	5825	0.0176	0.0097	0.0235	1
802.11ac20	5745	0.0156	0.0094	0.0332	1
	5785	0.0175	0.0099	0.0317	1
	5825	0.0147	0.0088	0.0290	1
802.11n40	5755	0.0186	0.0146	0.0300	1
	5795	0.0177	0.0140	0.0297	1
802.11ac40	5755	0.0180	0.0110	0.0227	1
	5795	0.0187	0.0113	0.0238	1
802.11ac80	5775	0.0195	0.0102	0.0273	1

Note:

2.4G WiFi(MIMO)+5.1G WiFi(MIMO)+5.8G WiFi(MIMO) simultaneous:
 $0.0404+0.0487+0.0332=0.1223 < 1$